

SONY

Color Video Camera

DXC-325K/325L/325H DXC-325PK/325PL/325PH

Opening Instructions

Before opening the package, please read this manual thoroughly and retain it for future reference.

Caution: When attaching the zoom lens to the color video camera.

If the zoom lens is attached to the color video camera incorrectly, the lens may be damaged.

Before attaching the lens, be sure to read the steps in Chapter 2, section page 17.

photocopy for service-use only



3CCD

OWNER'S RECORD

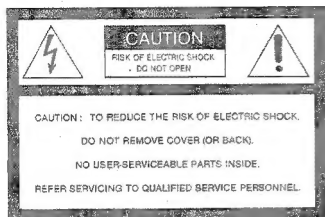
The model and serial numbers are located on the right side. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No. _____ Serial No. _____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Warning—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC Rules.

For the customers in Canada

This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

Table of Contents

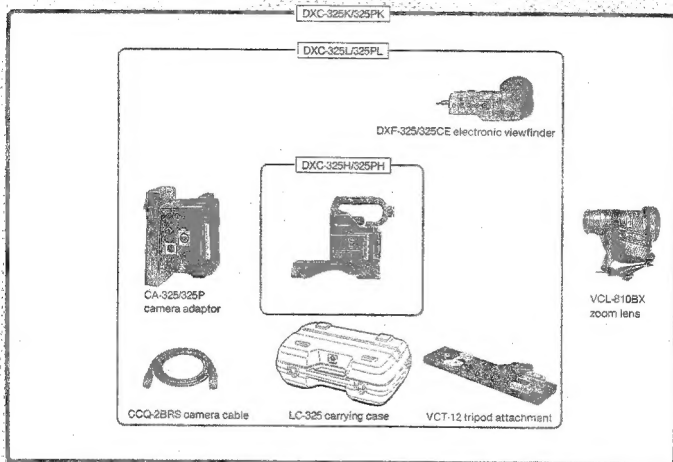
| | |
|--|----|
| Composition | 3 |
| Features and Notes on Use | 4 |
| Features | 4 |
| Precautions | 5 |
| Special Characteristics of a CCD | 5 |
| Location and Function of Controls | 6 |
| DXC-325/325P Camera Head | 6 |
| CA-325/325P Camera Adaptor | 10 |
| VCL-810BX Zoom Lens | 12 |
| DXF-325/325CE Electronic Viewfinder | 14 |
| Accessory Attachment | 16 |
| Camera Adaptor Attachment/Detachment | 16 |
| Lens Attachment | 17 |
| Viewfinder Attachment | 18 |
| Microphone Attachment | 20 |
| Tripod Attachment | 21 |
| Power Sources | 22 |
| Power from the DC IN Connector | 22 |
| Power from the Battery Pack Compartment | 23 |
| Power from the VTR/CCU/CMA Connector | 24 |
| Connections | 26 |
| Connection with an S-VHS Format Portable VTR | 26 |
| Connection with a Portable VTR | 27 |
| Connection with a Table-Top VTR | 28 |
| Connection with a CCU-M3/M3P Camera Control Unit | 28 |
| Function of the Connected VTR | 29 |
| Adjustments | 30 |
| Preparation | 30 |
| Viewfinder Adjustment | 31 |
| Video Monitor Adjustment | 32 |
| Flange Focal Length Adjustment | 33 |
| Iris Adjustment | 34 |
| Filter Selection | 34 |
| White Balance and Black Balance Adjustments | 35 |
| Operation | 37 |
| Preparation | 37 |
| Recording with a Portable VTR | 37 |
| Zooming | 38 |
| Output Level Adjustment | 39 |
| Checking the Video Level | 39 |
| Close-Ups | 40 |
| Use of the GEN LOCK Connector | 41 |
| Recording with a Table-Top VTR | 42 |
| Warning Indicators and Character Display | 43 |
| Warning Indicators on the Viewfinder | 43 |
| Warning Indicators on the Character Display | 43 |
| Character Display on the Viewfinder | 44 |
| Studio Use | 49 |
| System Example | 49 |
| Hints for Better Shooting | 50 |
| Understanding Light and Color | 50 |
| Basic Camerawork | 51 |
| Cutting | 54 |
| Lighting | 55 |
| Specifications | 56 |
| Optional Accessories and Recommended Equipment | 57 |
| Packing (Carrying Case LC-325) | 58 |

Composition

This instruction manual is for both the DXC-325 series (DXC-325K/325L/325PH) and the DXC-325P series (DXC-325PK/325PL/325PH) color video cameras. These two types of cameras are designed for different signal systems, the NTSC and the PAL systems. So each type of camera must be used with the equipment which matches its signal system, but the operating procedures for both series are the same. The DXC-325 series is for the NTSC color system, and the DXC-325P series is for the PAL system.

The DXC-325K/325PK, the DXC-325L/325PL and the DXC-325H/325PH comprise slightly different components, as noted below. However, the operating procedure for the camera itself is the same.

If you use a zoom lens other than the VCL-810BX zoom lens, refer to the lens' instruction manual for information about its operation.



| Composition | DXC-325K/325L | DXC-325H/325PH |
|--|---------------|----------------|
| Camera head DXC-325/325P | Yes | Yes |
| Camera adaptor CA-325/325P | Yes | No |
| Zoom lens VCL-810BX | Yes | No |
| Viewfinder DXF-325/325CE | Yes | No |
| Carrying case LC-325 | Yes | No |
| Camera cable CCQ-2BRS | Yes | No |
| Tripod attachment VCT-12 | Yes* | No |
| Chart for flange focal length adjustment | Yes | Yes |

* Supplied only with the DXC-325K/325L (NTSC model).

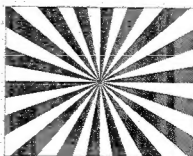


Chart for flange focal length adjustment

Features and Notes on Use

Features

The DXC-325/325P is a newly designed portable color video camera employing three 1/2-inch Charge Coupled Device (CCD) imagers each having a total of 250,000/290,000 (for the NTSC and PAL models respectively) effective picture elements. The DXC-325/325P is normally used with the CA-325/325P camera adaptor as a single camera unit, but, if necessary, it can be separated from the camera adaptor and can be used with a variety of different units which will be introduced in the market in the near future. The camera can be used for outdoor recording when used with a portable video cassette recorder, and can also be used as a studio camera when connected to a CCU-M3/M3P camera control unit.

Adoption of CCD

- Incorporation of 3 CCD results in a compact, lightweight camera body which consumes less power than does a camera using pickup tube(s).
- Low lag, high resistance to image burning and no deflection distortion.
- The CCD is not affected by vibration and mechanical shock.
- The CCD imager is not influenced by terrestrial magnetism.
- Thanks to the high signal-to-noise ratio, the video output level can be raised by 9 dB or 18 dB to obtain a clear picture under low light conditions.
- The electronic shutter is built into the imagers and enables the DXC-325/325P to produce clear images even when the objects it is shooting are moving at very high speeds. The advantages of this function are most obvious during playback of still or slow motion pictures.

Various connection capability

- The camera can be used as a studio camera when connected to a CCU-M3/M3P camera control unit.
- The camera can be connected to an S-VHS format VTR.
- If a special adaptor (will be introduced in the near future) is attached to the DXC-325/325P camera head, it can output an RGB format signal.

Power source

- A compartment for the NP-1A battery pack is built into the camera adaptor. The camera and 1.5-inch viewfinder can be used for about 120 minutes with a fully charged NP-1A (optional).
- The power can be supplied to the camera from a portable VTR or from the CCU-M3/M3P camera control unit.
- A CMA-85CE camera adaptor (optional) is needed if the camera is to be used with the AC power source.

Automatic adjustment and memory functions

- The white balance and black balance are automatically adjusted by a microcomputer, and the adjusted values are retained for about 12 hours while the camera's power is off.
- The black level drift is automatically adjusted, together with the black balance.
- If the entire picture is too bright, the black level is lowered to the appropriate level by the automatic black level (ABL) adjustment so that a picture with good contrast can be obtained.

Display and related functions

- The character generator built into the camera displays title characters to be inserted on the viewfinder or monitor during recording.
- In addition to title characters, the operational status of the camera and the warning indications are also displayed on the viewfinder.
- The REC indicator on the viewfinder blinks if a VTR malfunctions.
- Zebra pattern appears on the viewfinder screen when the video output level is about 70 to 80 IRE (for NTSC model) or 490 to 560 mV (for PAL model). This pattern provides a useful reference when the operator manually adjusts the Iris.

Wireless electrical connection to the VHS-C 8000 camera lens unit

- The DXC-325/325P is equipped with a pin-type lens connector which connects directly to the electrical circuitry of the lens unit. The lens can thus be controlled from the video camera without using a lens cable.

Location of controls to avoid misoperations

- The switches which are not used frequently are located behind the cover on the side panel so that you can forget about possible misoperations while you are using the video camera.

Newly designed camera body and lens grip

- The camera will be well balanced on your shoulder when holding it with the lens grip. In addition, you can see to your right over the camera body while you are shooting.

Precautions

Safety

- Do not try to mount a 2/3-inch lens directly on the DXC-325/325P.
Be sure to attach an LO-32BMT lens mount adaptor (optional) to your 2/3-inch lens if you want to mount it.
- Operate the camera only on 12 V DC. For operation from an AC power line, use the camera adaptor recommended for this camera.
- Allow adequate air circulation to prevent internal heat build-up.

Operation

- Avoid rough handling or mechanical shock.
- Do not operate the camera outside a -5°C to $+45^{\circ}\text{C}$ (23°F to 113°F) temperature range.
- Keep the camera in a horizontal plane.
- Keep the camera away from very strong magnetic fields to avoid distortion and flutter on the screen.
- Do not hold the camera by the viewfinder.
- Be sure to cover the lens with the supplied lens cap when the video camera will not be used for a long period of time.

Operation of the viewfinder

- Do not point the viewfinder directly at the sun, or the plastic inside the viewfinder may be damaged.
- The picture on the viewfinder screen may be distorted if it is used in strong magnetic fields.

Cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine, which might damage the finish.

Repacking

Do not discard the carton. It affords maximum protection whenever the camera is transported. Do not transport or ship the camera only in the carrying case. Repack it as it was originally packed at the factory.

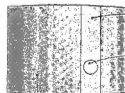
If you have any questions about this camera, contact your authorized Sony dealer.

Special Characteristics of a CCD

The following phenomena may appear on the monitor screen while the DXC-325 series color camera is used. These phenomena are not indicative of a camera malfunction.

Smear phenomenon

This may appear when a very bright object is shot.



Video monitor screen

White dots

White dots may appear in the video output if the camera is used under very high temperatures.

Wavy pictures

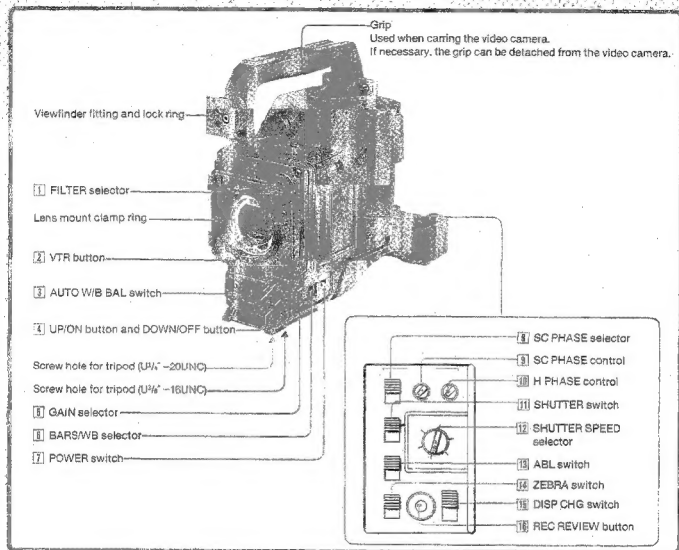
This may appear when fine stripes, straight lines, etc., are shot. Their images monitored on the screen look wavy.

Note on the electronic shutter

If the GAIN selector is set to the 18 (dB) position when the electronic shutter is used, a clear picture may not be obtained. Use the electronic shutter under the lighting conditions under which a clear picture is obtained with the GAIN selector set to the 0 or 9 (dB) position.

Location and Function of Controls

DXC-325/325P Camera Head



1 FILTER selector

Select the appropriate filter as indicated below.

| Filter number | Color temperature | Lighting conditions |
|---------------|-------------------|--------------------------------|
| 1 | 3200K | Iodine lamp, sunrise or sunset |
| 2 | 5600K + 1/4 ND * | Bright outdoor |
| 3 | 5600K | Cloudy or rainy |

*ND: Neutral density filter

2 VTR button

When the camera is connected to a portable VTR, press this button to start recording. To stop recording, press the button again. If the camera is connected to a CCU-M3/M3P camera control unit, the return video pictures can be monitored on the viewfinder screen while the button is kept depressed. When the button is released, the camera pictures can be monitored.

3 AUTO W/B BAL (automatic white/black balance adjustment) switch

When the BARSWB selector 6 is set to AUTO, white balance and black balance can be automatically adjusted with this switch. Black balance can also be adjusted automatically with this switch when the BARSWB selector is set to 3200K.

WHT: For automatic white balance adjustment, push this switch to WHT. The adjusted value will be automatically stored in the memory.

BLK: For automatic black balance and black set level adjustment, push this switch to BLK. The adjusted value will be automatically stored in the memory. This switch automatically returns to the center position when it is released.

4 UP/ON button and DOWN/OFF button

These buttons are used with the DISP CHG switch (1) to set and position the title characters, (2) to switch the "LOW LIGHT" indication on or off, (3) to raise or lower the reference level of the automatic iris adjustment, or (4) to raise or lower the master pedestal level. For details, refer to "Warning Indicators and Character Display" on page 43.

5 GAIN selector

Normally set this selector to "0". When the selector is set to "9" or "18", the video output level is raised by 9 dB or 18 dB respectively.

6 BARS/WB (color bar generation/white balance adjustment) selector

BARS: When the selector is set to this position, a color bar signal is generated, supplied to the viewfinder and output from the VIDEO OUT and the VTR/CCU/CMA connectors on the CA-325/325P. Use this position for adjusting the video monitor. At this position, the iris of the zoom lens attached to the camera will be automatically closed.

AUTO: Generally set the selector to this position.

When the AUTO WB/BAL switch (3) is set to WHT or BLK, the white balance or black balance will be automatically adjusted (and stored in the memory).

After the adjustment, the memorized white balance and black balance values are always obtained at this position.

3200K: At this position the white balance is set to the factory preset value of an incandescent lamp (3200K). When the selector is set to this position, set the FILTER selector (1) to an appropriate position. Use this position when there is no time to adjust the white balance. When the BARS/WB selector is set to this position, the automatic white balance adjustment of the AUTO WB/BAL switch (3) will not operate. However, the automatic black balance adjustment of the AUTO WB/BAL switch (3) operates.)

7 POWER switch

ON: To turn on the camera
OFF: To turn off the camera

8 SC (subcarrier) PHASE selector

When two or more cameras are used simultaneously, select the SC phase difference between the gen-lock input and video output signals so that it is roughly adjusted to 0° or 180°. (See page 41.)

9 SC (subcarrier) PHASE control

When two or more cameras are used, this control is used for fine adjustment of the SC phase after the rough adjustment performed by the SC PHASE selector (8). (See page 41.)

10 H (horizontal) PHASE control

When two or more cameras are used, turn this control with a small screwdriver to adjust the H phase difference between the gen-lock input and video output signals. (See page 41.)

Notes

- It is not necessary to use this control when only one camera is used.
- When a camera control unit is connected, adjust the H phase difference with the H PHASE control of the camera control unit.

11 SHUTTER switch

ON: The SHUTTER SPEED selector (12) is activated.

OFF: Normally, set at this position. This deactivates the SHUTTER SPEED selector (12).

12 SHUTTER SPEED selector

Used to switch the shutter speed.

The following six shutter speeds can be selected on this camera head.

DXC-325: 1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000 sec.

DXC-325P: 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000 sec.

13 ABL (automatic black level) switch

When the entire picture is too bright, such as during outdoor shooting, set this switch to ON. The black level will be reduced to the appropriate level, and a well-contrasted picture will be obtained.

Normally set the switch to OFF.

14 ZEBRA switch

This switch is used for manual iris adjustment. When the switch is set to ON, a zebra pattern appears as a reference on the part of the viewfinder screen where the video level of the object is 70 to 80 IRE (for NTSC) or 490 to 560 mV (for PAL). If the zebra pattern is not necessary, set this switch to OFF. (See page 39.)

15 DISP CHG (display change) switch

Each time this switch is pressed, the character display on the viewfinder screen changes in the following order: (1) alarm indication, (2) "LOW LIGHT" indication on/off, black balance, white balance, and gain settings, (3) initial indication of title setting and display of set title characters, (4) reference level setting for automatic iris adjustment, and (5) master pedestal level setting. For details, refer to "Warning Indicators and Character Display" on page 43.

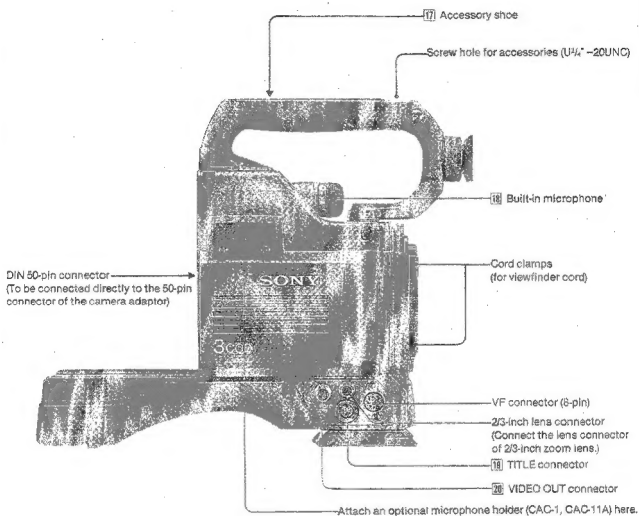
Note

In the character display modes (3) to (5), the automatic white balance and black balance adjustment systems do not function.

16 REC REVIEW button

Not used.

DXC-325/325P Camera Head



17 Accessory shoe

An optional BXF-40A/40ACE or DXF-50/50CE viewfinder can be attached here. For viewfinder attachment, refer to the viewfinder's instruction manual.

18 Built-in microphone

When the camera cable is connected to a portable VTR, the built-in microphone is automatically connected, so a sound recording can be made simultaneously with the video recording.

When an external microphone is connected to the MIC-IN connector on the CA-325/325P, the built-in microphone does not function.

19 TITLE connector (8-pin)

A TGP-325 title generator (optional) is to be connected to this connector.

20 VIDEO OUT (output) connector (BNC connector)

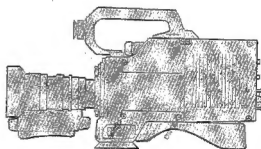
Connect to the video input of the VTR or video monitor. Title characters displayed on the viewfinder screen are also output from this connector.

To use the control unit with DXC-325/325P in the genlocked condition, set the switch S9 inside the DXC-325/325P to the appropriate position depending on the type of the control unit.

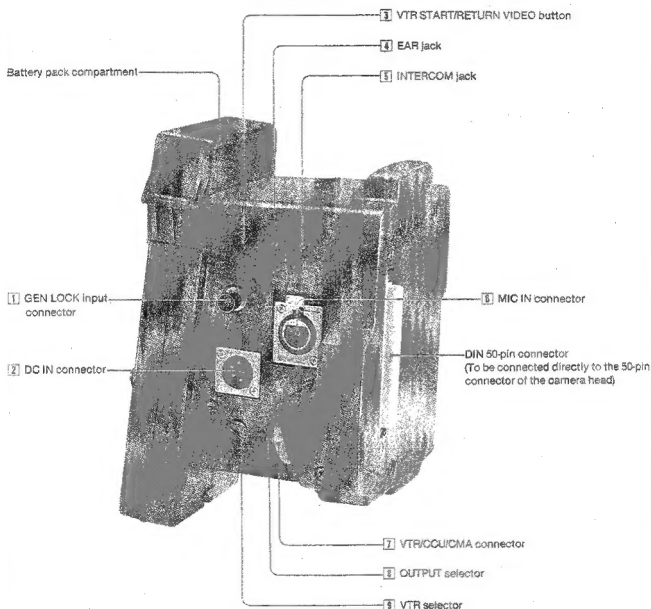
1. Turn off the power of the DXC-325/325P.
2. Detach the side panel with four screws on which the model and serial numbers are located.
(Loosen the four screws indicated by the four arrows in the illustration on the right.)
3. Set switch S9 on the AT-53 board as follows:

| Switch position | Control unit (The combined camera adaptor) |
|---|---|
| Upper (toward the grip side) | RM-M7G (CA-325A/325AP/325B) |
| Lower (toward the shoulder pad side) Factory-setting | CCU-M3/M3P (CA-325/325P) |

4. Attach the side panel.



CA-325/325P Camera Adaptor



- 1 GEN LOCK input connector (BNC connector)**
Connect the gen lock input signal (VBS or BS) for synchronization here. No connection is necessary when only one camera is used.

- 2 DC IN (input) connector (XLR 4-pin)**
This connector is equipped for supplying power from an external DC power supply (12V DC).

Note

When the battery is connected to this connector, the power is automatically cut off from both the NP-4A inside the battery pack compartment and the VTR/CCU/CMA connector.

Pin configuration

- 1: GND
- 2: NC
- 3: NC
- 4: +12V DC



3 VTR START/RETURN VIDEO button

When the camera is connected to a portable VTR, press this button to start recording. To stop recording, press the button again.

If the camera is connected to a CCU-M3/M3P camera control unit, the return video picture can be monitored on the viewfinder screen while the button is kept depressed. When the button is released, the camera picture can be monitored.

4 EAR (earphone) jack (mini jack)

Connect an earphone to monitor the playback or recording sound from the VTR.

5 INTERCOM jack (mini intercom jack)

Connect a DR-100 intercom headset (optional) here. It will be possible to communicate between the camera and the connected camera control unit or video switcher.

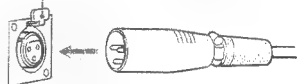
- 6 MIC IN (microphone input) connector (XLR 3-pin, Unbalanced)**
Connect a microphone here.

Pin configuration

- 1: GND
- 2: Hot
- 3: Cold



To remove, press here.



7 VTR/CCU/CMA connector

Used to connect the video camera to a CCU-M3/M3P camera control unit or a CMA-8/BCE camera adaptor. All video, audio, and control signals as well as power are supplied from/to the video camera via this connector.

8 OUTPUT selector

Used to select the signal to be output from the VTR/CCU/CMA connector [7].

Y/C: A Y/C separate signal will be output.

VBS: A composite video signal will be output.

9 VTR selector

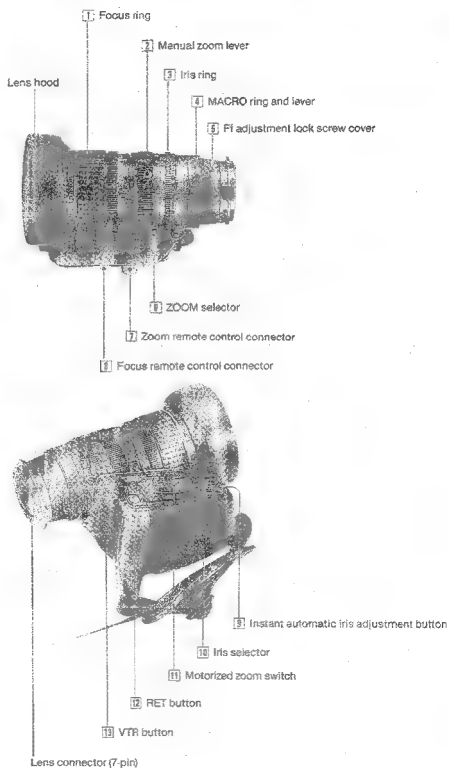
Selects the VTR start/stop signal levels, etc. in accordance with the type of VTR used. For details, refer to the table on page 23.

- 1: For a VTR equipped with a Q-type (14-pin) camera connector such as the Sony VO-6800/6800PS, BVU-110/111/12P or for the CCU-M3/M3P.
 - 2: For a VTR equipped with a K-type (14-pin) camera connector, such as the Sony SL-2000/QTSC, SL-FL1E (PAL) or other Betamax VTRs used for home entertainment.
 - 3: For a VHS format VTR manufactured by JVC.
 - 4: For a VHS format VTR manufactured by Panasonic.
- For an S-VHS format VTR manufactured by Panasonic.

Caution

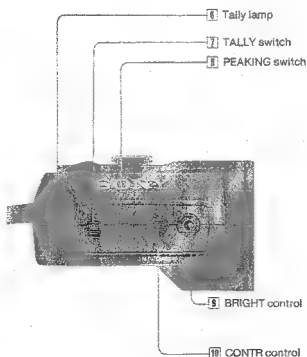
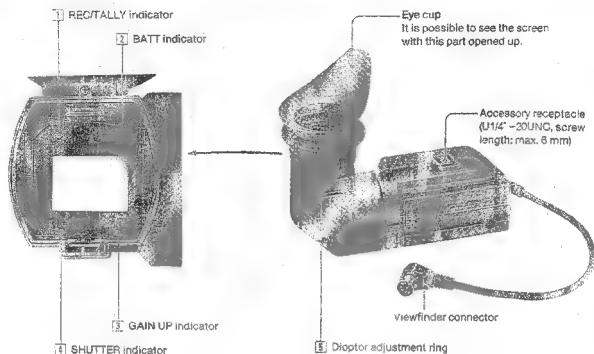
Be sure to set the VTR selector to the correct position for the VTR used. If it is not, the VTR might not operate properly.

VCL-810BX Zoom Lens



- 1 **Focus ring**
Turn this ring for focusing.
- 2 **Manual zoom lever**
For manual zooming, turn this lever with the ZOOM selector 3 set to MANU.
- 3 **Iris ring**
For manual iris adjustment, turn this ring with the iris selector 10 set to M.
- 4 **MACRO (close-up) ring and lever**
Used for close-ups. See page 40.
- 5 **Ff (flange focal length) adjustment lock screw cover**
For Ff adjustment, take this cover off.
- 6 **ZOOM selector**
SERVO: For motorized zooming.
MANU: For manual zooming.
- 7 **Zoom remote control connector (6-pin)**
Connect an LO-27 lens remote control unit (optional) for remote control of zooming when the camera is attached to a tripod.
- 8 **Focus remote control connector (6-pin)**
Not used.
- 9 **Instant automatic iris adjustment button**
The iris is automatically adjusted while this button is kept depressed, when the iris selector 10 is set to M. When the button is released, the iris will be fixed at the value that has just been obtained until the iris is adjusted again manually.
- 10 **Iris selector**
A: For automatic iris adjustment.
M: For manual iris adjustment.
- 11 **Motorized zoom switch**
Press either end of this switch for motorized zooming with the ZOOM selector set to SERVO. W for a wide-angle picture and T for a telephoto picture. Zooming is faster when the switch is pressed down all the way and slower when the switch is pressed down only slightly.
- 12 **RET (return video) button**
Press to view the picture from the VTR during recording, the playback picture during playback, or the signal from a control console such as a video switcher on the viewfinder screen. This button has the same function as the VTR START/RETURN VIDEO button of the camera (return video switch) when a CCU-M3/M3P is connected.
- 13 **VTR button**
When a portable VTR is connected to the camera, press this button to start and stop recording. This button has the same function as the VTR START/RETURN VIDEO button of the camera (start switch).

DXF 325/325CE Electronic Viewfinder



1 REC/TALLY indicator

Illuminates during recording with one camera, and illuminates when the camera's picture is selected by a control console, a video switcher, etc., connected to the CCU-M3/M3P camera control unit which is connected to the camera.

The indicator blinks in accordance with the warning system of the VTR.

2 BATT (battery) indicator

Starts blinking several minutes before the battery of the VTR or the CCU-M3/M3P is discharged to a level at which it cannot power the VTR or the CCU (about 11 V), and illuminates steadily when the battery has discharged to that level. (For details, refer to the table on page 43.)

3 GAIN UP indicator

Lights up when the GAIN selector is set to 9 dB or 18 dB.

4 SHUTTER indicator

This indicator lights up when the SHUTTER switch on the video camera unit is set to ON.

5 Diopter adjustment ring

Adjusts the diopter. For details about adjustment procedures, see page 31.

6 Tally lamp

When the TALLY switch [7] is set to ON, this lamp operates the same as the REC/TALLY indicator [1].

7 TALLY switch

The tally lamp [6] can be activated or deactivated if necessary, by setting this switch to ON or OFF.

8 PEAKING switch

Increases the sharpness in the picture on the viewfinder for easy focusing by setting this switch to ON.

Note

This switch does not affect the output signal of the camera.

9 BRIGHT (brightness) control

Adjusts the brightness of the picture on the viewfinder screen. To obtain a brighter picture, turn this control clockwise.

Note

This control does not affect the output signal of the camera.

10 CONTR (contrast) control

Adjusts the contrast of the picture on the viewfinder screen.

Note

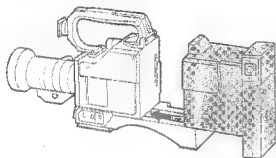
This control does not affect the output signal of the camera.

Accessory Attachment

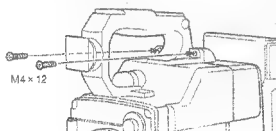
Camera Adaptor Attachment/detachment

To attach the CA-325/325P to the video camera

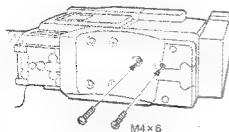
- 1 Push the camera adaptor forward along the groove.



- 2 Fix the camera adaptor with the two screws at the connecting part.

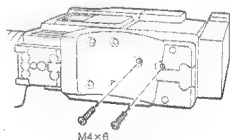


- 3 Tighten the two screws at the bottom of the shoulder pad.

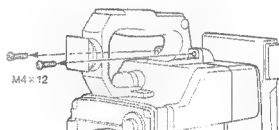


To detach the CA-325/325P from the video camera

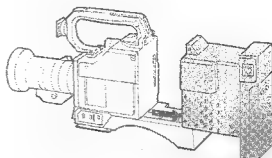
- 1 Loosen the two screws at the bottom of the shoulder pad.



- 2 Remove the two screws at the connecting part.



- 3 Pull the camera adaptor back and off.

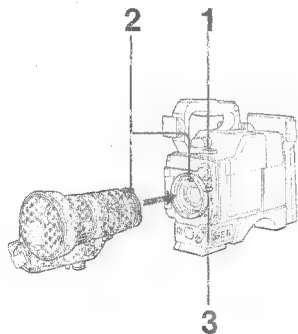


Lens Attachment

Caution

Check that the lens you are going to mount is a 1/2-inch lens. A 2/3-inch lens cannot be directly attached to the lens mount of the video camera. Do not try to mount a 2/3-inch lens directly to the video camera's lens mount as doing so will damage the optical block of the video camera.

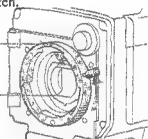
A 2/3-inch lens can only be mounted with an LO-32BMT lens mount adaptor (optional). See the instructions supplied with the LO-32BMT for how to use the LO-32BMT. Before attaching the lens, remove the protective caps from the mounts of the camera and the lens.



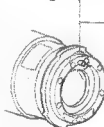
- 1** Turn the mount clamp ring to match its red point to the lens notch.

Red point

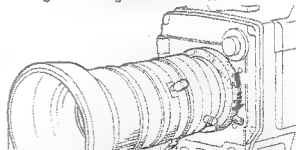
Notch



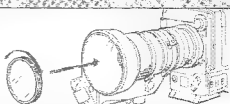
- 2** Align and insert the lens into the lens mount.



- 3** Tighten the ring to secure the lens.

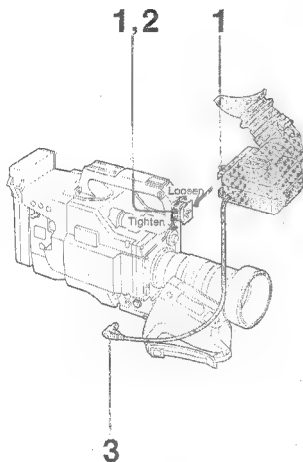


How to attach an optional filter to the lens.
The filter can be attached without detaching the lens hood.
Screw the filter on clockwise to attach.

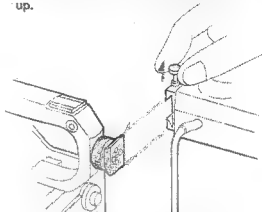


Screw the filter into the screw thread of the hood.

Viewfinder Attachment

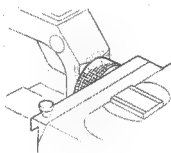


- 1 Loosen the lock ring, and align and slide the viewfinder into the mount, while pulling the pin up.

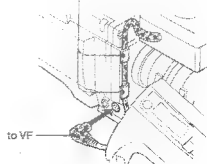


To detach the viewfinder, loosen the lock ring, and slide the view finder while pulling the pin up.

- 2 Tighten the lock ring.

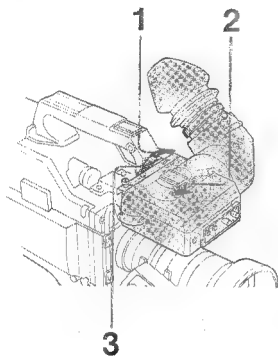


- 3 Clamp the cord.



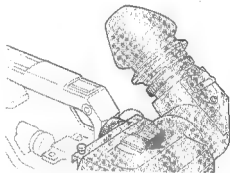
For easy operation of the viewfinder

Adjustment of horizontal position



- 1 Loosen the lock ring.
- 2 Slide the viewfinder to the desired position.
- 3 Tighten the ring.

To insert the camera into the carrying case with the viewfinder attached to it, slide the viewfinder to the "▼" mark and tighten the lock ring.



The position of the eye cup



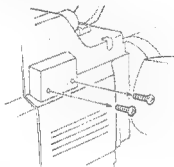
- 1 Move the eye cup up and down for comfortable use.
- 2 Rotate the eye cup to fit the eye used for viewing.

Microphone Attachment

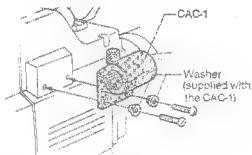
In order to use an ECM-672 external microphone (optional), first attach a CAC-1 or CAC-11A microphone holder (optional) to the camera head.

The CAC-11A microphone holder can also be attached in the same manner.

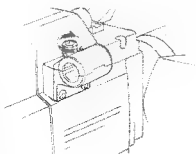
- 1** Remove the two screws from the side of the camera head.



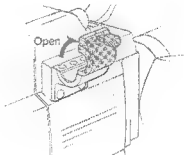
- 2** Attach the CAC-1 using the screws supplied with the DXC-325/325P.



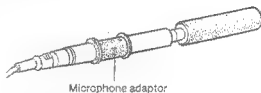
- 3** Loosen the screw of the microphone holder.



- 4** Open the microphone holder.

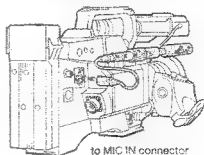


- 5** Attach a microphone adaptor to the microphone when a thin microphone is used.



When the ECM-672 is used, the microphone adaptor is not necessary.

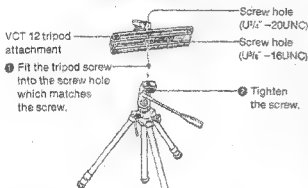
- 6** Insert the microphone to the microphone holder, and tighten the screw.



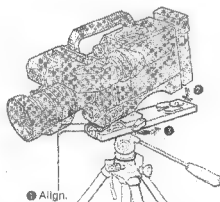
Tripod Attachment

Although the camera can be mounted on a tripod directly, use a VCT-12 tripod attachment when mounting with a large viewfinder.

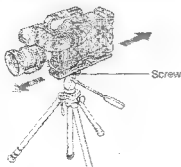
1 Attach the tripod attachment to the tripod.



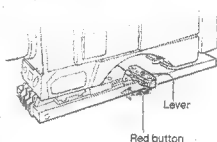
2 Attach the camera.



3 Slightly loosen the tripod screw, and move the camera to be balanced. Tighten the screw.



Camera detachment



While depressing the red button, slide the lever to the left to release the lock. Remove the camera.

Power Sources

Note on priority of power sources

The DXC-325/325P operates on any of the following three types of power sources:

- (1) Power from the DC IN connector
- (2) Power from the battery pack compartment
- (3) Power from the VTR/CCU/CMA connector:
 - Power from the VTR when connecting a portable VTR
 - Power from the CCU when connecting a CCU-M3/M3P camera control unit
 - Power from the camera adaptor when connecting a CMA-8/8CE camera adaptor

When two or three of the power sources (1) to (3) are simultaneously connected to the camera, only one of them is used according to numerical order priority, and the other power source(s) is (are) automatically cut off.

Power from the DC IN Connector

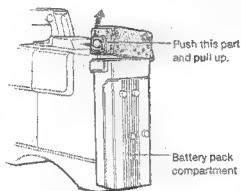
This connector is equipped for supplying power from an external DC power supply (12V DC).

Power from the Battery Pack Compartment (An NP-1A Battery Pack)

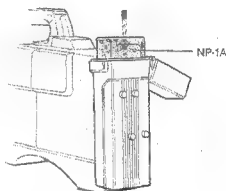
Use a fully charged NP-1A battery pack (optional) by inserting it into the battery pack compartment.

Installing an NP-1A battery pack

- 1** Pull up the lid of the battery case.



- 2** Install the battery pack, and close the lid.



Battery life

Continuous operation time

When using one fully charged NP-1A: About 120 minutes

Battery life warning

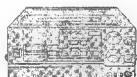
When the battery is nearly exhausted, the warning "BATT: EMPTY?" appears on the viewfinder screen. If you continue to use the battery after the "BATT: EMPTY?" warning has appeared, the BATT indicator of the viewfinder also lights up to indicate that the battery must be replaced immediately.

Battery charging

Recharge the NP-1A battery pack before each use, using the BC-1WA battery charger. It takes about 60 minutes at the normal temperature. For details on recharging, refer to the battery charger's instruction manual.

Power from the VTR/CCU/CMA Connector

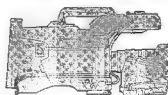
Power from a portable VTR



Portable VTR equipped with a Q-type (14-pin) camera connector

to camera connector

DXC-325/325P



CCU camera cable (supplied or optional)

Align and insert.



VTR/CCU/CMA

Notes

- When the portable VTR is operated from rechargeable battery packs, the continuous operating time of the camera and portable VTR is about 90 minutes at normal temperatures (when the VO-6800/6800FS portable videocassette recorder and two NP-1A battery packs are used). The life of the batteries installed in the portable VTR is indicated by the BATT indicator of the viewfinder. (see page 43.)
- Refer to the VTR's instruction manual for information on the power supply to the VTR.

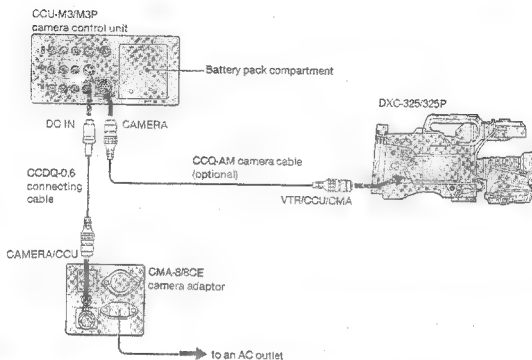
CAUTION

- Before operating the camera, make sure that the power supplied from the VTR to the camera is sufficient. If the power supply capacity of the VTR is not sufficient, the camera must be powered independently.
- When a portable VTR equipped with a K-type (14-pin) camera connector is used, the camera must be powered independently, because power is not supplied through the GOOK cable.

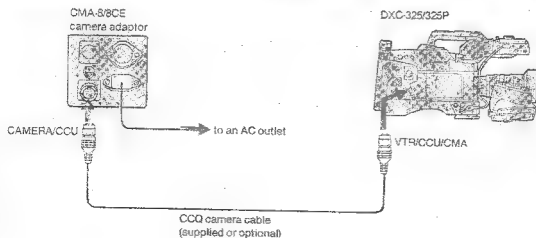
Power from a CCU-M3/M3P camera control unit

When the CCU is powered by the battery pack, the life of the battery pack installed in the CCU is indicated by the BATT indicator of the viewfinder.

For details on the power sources for the CCU, refer to the CCU's instruction manual.



Power from a camera adaptor



Connections

Before making connections, make sure that the power switches of the camera and other equipment are turned off.

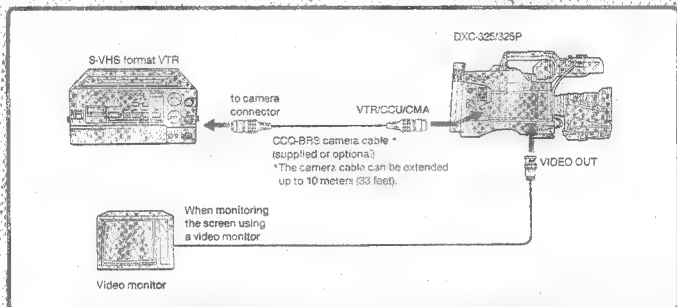
Connection with an S-VHS Format Portable VTR

Set the OUTPUT selector on the camera adaptor to Y/C when you connect an S-VHS format portable VTR.

The video signal output to CCQ camera cable is now the Y/C separate signal.

The video signal output to the VIDEO OUT connector is still the usual composite video signal.

When using a VTR which records with a composite video signal next time, change the setting of the OUTPUT selector to VBS.



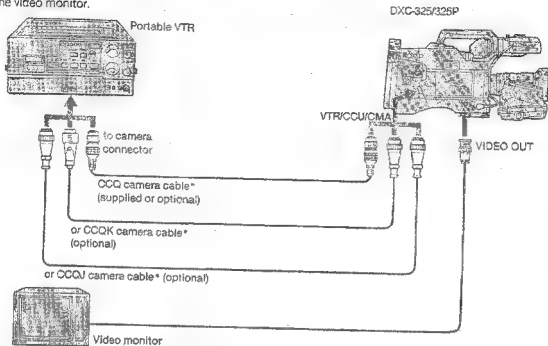
Notes

- Picture monitoring of the Y/C separate signal is possible if the monitor is equipped with the S video input jacks. Connect the VTR and the S video input jacks of the monitor. In this case, connection between the VIDEO OUT connector of the camera and the monitor is unnecessary.

- Superimposed title characters (see page 46) do not appear on the screen when the Y/C separate signal is output through the CCQ-BRS camera cable. Connect a TGR-325 title generator (Optional) to the TITLE connector, and the characters superimposed by the TGR-325 can be seen on the viewfinder or the monitor connected to the VIDEO OUT connector of the camera.

Connection with a Portable VTR

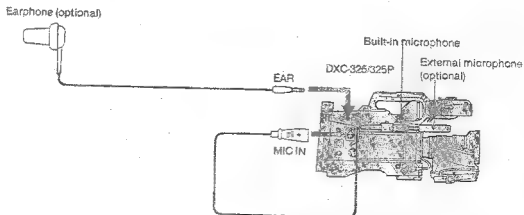
When monitoring the picture using a video monitor, connect the video monitor.



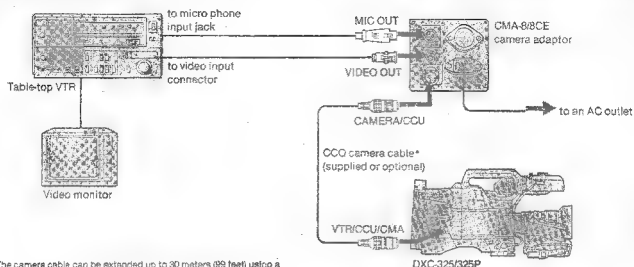
* The camera cable can be extended up to 10 meters (33 feet) using a CCQ camera cable. Consult your authorized Sony dealer.

Connection for simultaneous audio recording

To avoid recording noise made while handling the camera, connect an external microphone to the **MIC IN** connector. The built-in microphone will be automatically shut off.

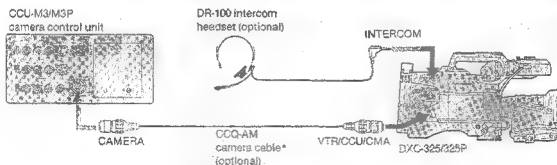


Connection with a Table-Top VTR



* The camera cable can be extended up to 30 meters (99 feet) using a CCO camera cable. Consult your authorized Sony dealer.

Connection with a CCU-M3/M3P Camera Control Unit



* The camera cable can be extended up to 10 meters (33 feet) using a CCO-AM camera cable. Consult your authorized Sony dealer.

Notes on operation with the CCU-M3/M3P

- When the camera is connected to the CCU-M3/M3P camera control unit, set the selectors as follows:
 - VTR selector: 1
 - OUTPUT selector: VBS
 - Switch S9 on the AT-53 board (See page 9)
- When the camera is connected to the CCU, the following switches will not operate: GAIN selector, BARS/WB selector, H PHASE control, SC PHASE control and SC phase selector.
- The MIC IN connector of the camera cannot be used as an

external microphone input.

- When the CCU's W/B BALANCE selector is set to PRESET or MANUAL, it adjusts the white balance and takes priority over the camera. If the W/B BALANCE selector is set to AUTO, the white balance can be adjusted by either the camera or the CCU. Automatic black balance adjustment is performed by setting the AUTO W/B BAL switch of the camera to BLK, irrespective of the position of the W/B BALANCE selector of the CCU.

Function of the Connected VTR

| VTR selector | Microphone level | Connected VTR | Remote control of VTR start/stop | REC indicator | | BATT alarm indication | Audio monitor for the camera | Picture shown on the viewfinder | | Cable for connection | Power supply from VTR to camera (See note 1.) | AC power adaptor for VTR |
|--------------|----------------------|---|----------------------------------|----------------|-----------|-----------------------|------------------------------|---------------------------------|-------------------|----------------------|---|----------------------------------|
| | | | | REC indication | VTR alarm | | | During recording | During play-back | | | |
| 1 | -60 dB (See note 2.) | VO-6800 (NTSC) VO-6800PS (PAL) | Yes | Yes | Yes | Yes | Yes | Yes Camera | Yes VTR | CCQ-nBRS | Yes | CMA-3 (NTSC) CMA-6CE (PAL) |
| | | VO-4800 (NTSC) VO-4800PS (PAL) | Yes | Yes | Yes | Yes | Yes | Yes Camera | Yes VTR | CCQ-nBRS | Yes | AC-340B (NTSC) AC-340CE (PAL) |
| | | BUU-50 (NTSC) BUU-50P (PAL) | Yes | Yes | Yes | Yes | Yes | Yes Camera | No | CCQ-nBRS | Yes | AC-590 (NTSC) AC-590CE (PAL) |
| | | BUU-110 (NTSC) BUU-110P (PAL) | Yes | Yes | Yes | Yes | Yes | Yes Camera | Yes VTR | CCQ-nBRS | Yes | AC-500 (NTSC) AC-500CE (PAL) |
| 2 | -20 dB | SL-2000 (NTSC) SL-F1E (PAL) | Yes | Yes | Yes | No | Yes | Yes Camera | Yes VTR | CCQ-2 | No | AC-220 (NTSC) AC-F1E (PAL) |
| 3 | -20 dB | HR-C3 (JVC, NTSC) HR-2200 (JVC, PAL) | Yes | Yes | No | No | Yes | Yes Camera | Yes VTR | CCQ-2 | No | |
| 4 | -20 dB | PV-5000 (Panasonic, NTSC) NV-9400 (Panasonic, PAL) AG-6400 (Panasonic, NTSC, PAL) | Yes | Yes | No | No | No | Yes Camera | Yes VTR | CCQ-2 | No | |
| | | AG-7400 (Panasonic, NTSC, PAL) | Yes | Yes | No | No | Yes | Yes Camera | Yes (See note 3.) | CCQ-nBRS | No | |

Notes

- For VTRs with "No" in the column "Power Supply from VTR to Camera", the power supply from the VTR is insufficient to operate a camera. Therefore, the independent power source must be provided for the camera. If the camera is operated without being powered independently, heat will build up in the VTR or AC power adaptor, and the protective circuit will activate. Consequently, the VTR or AC power adaptor will not operate properly.
- When the VO-6800/6800PS portable VTR is connected to the camera, the VTR's -20 dB/-60 dB camera microphone input level selector is set to -60 dB.
- A picture from a VTR can be seen only when the REST button is pressed.

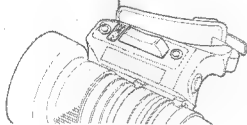
If the operating conditions of the VTR are different from those shown above, the VTR might not operate normally. If you use a VTR other than those shown above, for which the VTR selector must be set to "3" or "4", check the signal levels and other operating conditions.

Adjustments

Preparation

Check to be sure that the connections are made correctly, and set the switches as shown.

Iris selector → "A"
(See page 34.)

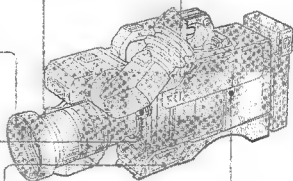


ABL switch → OFF

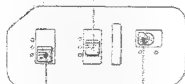


Remove the lens cap.

FILTER selector → appropriate position
(See page 34.)



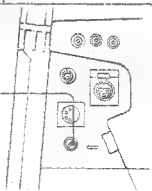
BARS/WB selector → AUTO



GAIN selector → 0 dB
(See page 39.)

POWER switch
→ ON

VTR selector
→ appropriate position
(See page 29.)

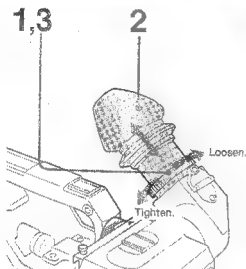


Point the camera at the object. While zooming in or out, turn the focus ring to focus the picture.

Viewfinder Adjustment

After adjusting the viewfinder and the eye cup, make the following adjustment so that the viewfinder screen can be seen comfortably.

Diopter adjustment (adjustable range: 0 D to -3 D)



Since each operator's eyesight varies, it is necessary to adjust the diopter each time the viewfinder is used by a new operator.

Adjust the diopter after focusing as follows.

- 1** Loosen the ring.
- 2** Slide this part back and forth so that the image can be monitored clearly.
- 3** Tighten the ring.

Viewfinders contrast and brightness adjustments

- 1** Set the BARS/WB selector to BARS.
- 2** Adjust the contrast and brightness with the CONTR and BRIGHT controls, referring to the color bar signals on the viewfinder screen.
- 3** Set the BARS/WB selector to AUTO after adjustment.

Viewfinders sharpness adjustments

Set the PEAKING switch to ON.
The picture on the viewfinder screen will be sharpened so that the lens can be easily focused.

Note

The settings of the PEAKING switch, and the CONTR and BRIGHT controls do not affect the video output signal of the camera.

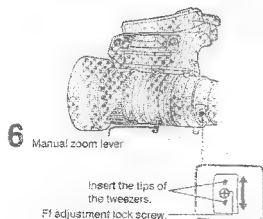
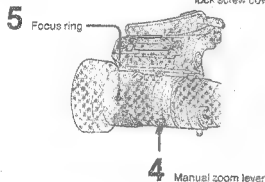
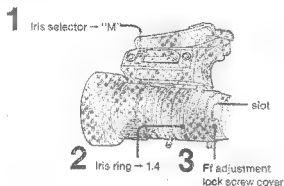
Video Monitor Adjustment

When a color video monitor is being used to monitor a picture, adjust the color of the monitor as follows.

- 1** Set the BARS/WB selector to BARS.
- 2** Adjust the color and hue controls on the monitor while viewing the color bars on the monitor screen.
- 3** Set the BARS/WB selector to AUTO.

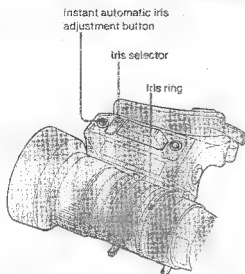
Flange Focal Length Adjustment

The proper flange focal length adjustment ensures that the object is in focus both at the wide-angle position and at the telephoto position when zooming.



- 1** Set the iris selector to "M".
- 2** Set the iris ring to "1.4". Position the supplied chart and illuminate it so that the proper video level is obtained when the iris ring is set to "1.4".
- 3** Place the tip of a screwdriver in the slot and remove the Ff adjustment lock screw cover.
- 4** Set the ZOOM selector to MANU and turn the manual zoom lever to the "80" telephoto position.
- 5** Turn the focus ring until the chart at about three meters (10 feet) from the lens is in focus.
- 6** Turn the manual zoom lever to the "8" wide-angle position.
- 7** Loosen the Ff adjustment lock screw and turn the Ff ring with a pair of tweezers (put the tips in the slots) until the chart is in focus. Be sure not to turn the focus ring.
- 8** Repeat Steps 4 through 7 until the chart is in focus both at the telephoto position and at the wide-angle position.
- 9** Tighten the Ff adjustment lock screw firmly, and then attach the Ff adjustment lock screw cover. Once the flange focal length adjustment has been made, readjustment is not necessary as long as the lens stays mounted on the same camera.

Iris Adjustment



Automatic adjustment

Set the iris selector to "A", and the iris will be automatically adjusted to the brightness of the object. Normally use the "A" position.

Manual adjustment

Set the iris selector to "M", and turn the iris ring. Manual adjustment may be effective when recording an object against a bright sky or a scene with high contrast.

Temporary automatic adjustment

While the instant automatic iris adjustment button is kept depressed during manual iris adjustment, the iris is automatically adjusted. When the button is released, the iris will be fixed at the value that has just been obtained until the iris is adjusted again manually.

Filter Selection

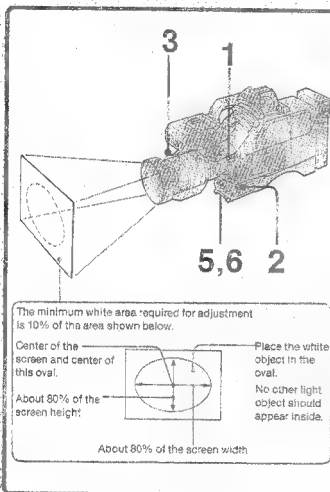
The color temperature changes according to lighting conditions. To compensate this, use the color temperature conversion filter indicated in the table below.

| Filter number | Lighting conditions |
|---------------|------------------------------|
| 1 | Iodine lamp, sunrise, sunset |
| 2 | Bright outdoor |
| 3 | Cloudy, rainy |

If the selected filter is not suitable for the lighting conditions, a warning such as "LOW LIGHT" will be shown on the viewfinder screen. For details on the warning, refer to "Warning Indicators and Character Display" on page 43.

White Balance and Black Balance Adjustments

Proceed with the following white balance and black balance adjustments in order to obtain picture clarity and lifelike color reproduction.



- 1** Set the **FILTER** selector properly according to the lighting conditions.
- 2** Set the **BARS/WB** selector to **AUTO**.
- 3** Zoom up on a white object using the same lighting conditions as those under which the recording will be made.
- 4** Set the lens iris selector to "**A**".
- 5** Press the **AUTO W/B BAL** switch toward **BLK**, and release it. "**BLK:OP**" will appear on the viewfinder screen during the automatic black balance adjustment. After the adjustment is completed, "**BLK:OK**" will be displayed for a few seconds.
- 6** Press the **AUTO W/B BAL** switch toward **WHT**, and release it. "**WHT:OP**" will appear on the viewfinder screen during the automatic white balance adjustment. After the adjustment is completed, "**WHT:OK**" will be displayed for a few seconds.

Notes

Readjustments of the white balance and black balance are necessary under the following conditions.

White balance:

- Each time the lighting conditions are changed
- If the "**MEMORY NG**" is displayed on the viewfinder screen, indicating the previous white balance value is no longer retained in the memory.

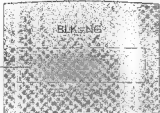
Black balance:

If the "**MEMORY NG**" is displayed on the viewfinder screen, indicating that the previous black balance value is no longer retained in the memory.

Adjustments

If the automatic black balance adjustment function does not work normally

The following indications will appear on the viewfinder screen.



BLK:NG

Cause —

:LENS CLOSE?

Cause: The lens iris did not close automatically during black balance adjustment.

Check:

- The lens function
- The lens connection

:CB SW MISS TOUCH?

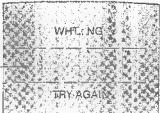
Cause: The BARS/WB selector is set to BARS during the black balance adjustment.

Check: The BARS/WB selector. Is it set to AUTO?

Try to make the black balance adjustment again after eliminating the problems described above.

If the automatic white balance adjustment function does not work normally

The following indications will appear on the viewfinder screen.



WHT:NG

TRY AGAIN

Cause —

:C.TEMP.LOW CHG.FILTER

:C.TEMP.HI CHG.FILTER

Cause: An inappropriate color temperature conversion filter was used.

Check: The filter type

:????

Cause:

- A white object was not used to make the adjustment.
- The adjustment was made with a very bright object inside the minimum white area required for white balance adjustment.

Check: The white pattern or object, and refer to Step 3 of the "White Balance and Black Balance Adjustments".

:LOW LIGHT

Cause: The light is insufficient.

Check:

- The lighting. If necessary, increase it.
- The video output level. If necessary, raise it using the GAIN selector.

Try to make the white balance adjustment again after eliminating the problems described above.

Memorized white balance and black balance values, in the DKO-3000ZP, a built-in memory stores the adjusted white balance and black balance values. Stored current values will be retained for about 12 hours after the power is turned off without any further power supply to the camera. Upon the adjustments are made once again, if the memorized values are erased, "MEMORY NG" will be displayed on the viewfinder screen the time the camera power is turned on. If this happens, adjust the white balance and black balance.

To start recording immediately without white balance adjustment

Set the BARS/WB selector to 2200K to obtain the white balance value preset at the factory.

Black setting

When the AUTO/WB BNL switch is set to BLK, the black level can be set to a reference black level of each channel (R, G, B) automatically. It is varied, together with the black balance.

Operation

Preparation

Before operation, set the switches as follows.

Adjust the contrast, brightness and diopter.

ABL → OFF

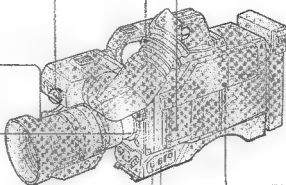
Iris selector → A

FILTER → appropriate position for lighting condition

GAIN → 0 dB

VTR selector → appropriate position for the VTR

BARS/WB → AUTO



Recording with a Portable VTR (connected with a GCQ, CCQK or CCQJ camera cable)

- 1 Turn the camera and the connected equipment on.
- 2 Adjust the black balance and white balance. For details, refer to "White Balance and Black Balance Adjustments" on page 35.
- 3 Point the camera at an object and adjust the lens.
 - Iris (See page 34)
 - Zoom (See page 39)
 - Focus
- 4 To start recording, press the VTR START/RETURN VIDEO button on the camera or the VTR button on the lens. The REC/TALLY indicator in the viewfinder will light during recording.

To stop recording, press the VTR START/RETURN VIDEO button or the VTR button again.

Note

For a brief period after the camera has been turned on, the BATT indicator of the viewfinder may light and random characters may be displayed on the viewfinder screen. (This is not a malfunction.)

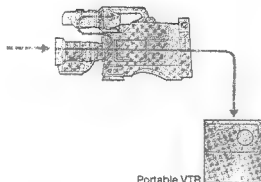
Monitoring the sound

The sound can be monitored during both recording and playback through an earphone connected to the camera's EAR jack.

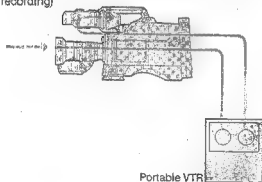
Monitoring the picture

The following three types of pictures can be seen on the viewfinder screen when the camera and the VTR are connected with the CCQ camera cable. (For details on the pictures which can be shown on the viewfinder screen, see page 29.)

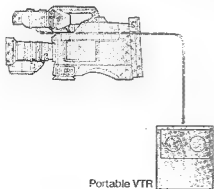
Picture picked up by the camera (during recording)



E-E mode picture from the VTR (return video) when the RET button on the lens is pressed (during recording)



Playback picture (during playback)



Note

While the playback picture from the VTR is displayed on the viewfinder screen, a part of the camera's video signals, such as a sync signal, may be mixed with the playback picture so that streaks of noise roll vertically or horizontally.

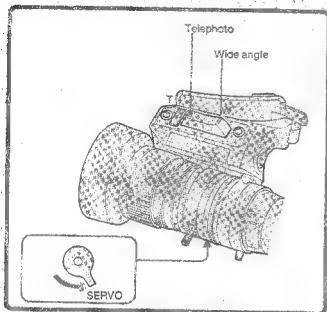
E-E Electric Selection mode

The input video signal to the VTR passes through the amplifier in the VTR and output from the video output connector without passing the video recording head and tape. The input signal to the VTR can be checked in this mode.

Zooming

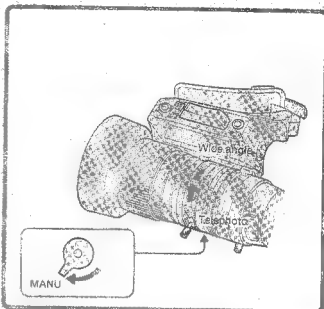
Motorized zooming

You can zoom smoothly. Zooming is faster when the motorized zoom switch is pressed down all the way and becomes slower when it is pressed down only slightly.



Manual zooming

Manual zooming allows more precise control of the zooming speed.



Output Level Adjustment

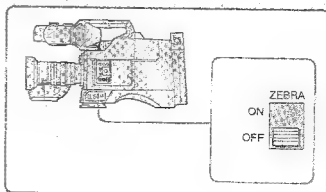
If a clear picture cannot be obtained because of insufficient lighting, set the GAIN selector to the appropriate position. Normally set the GAIN selector to "0".

The video output level can be raised by 9 dB by setting the GAIN selector to "9" and by 18 dB by setting the selector to "18".

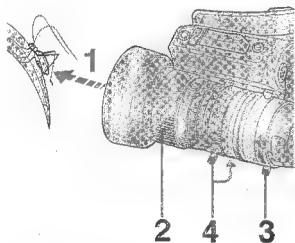
Checking the Video Level

When the ZEBRA switch is set to ON, a zebra pattern will appear on the part of the viewfinder screen when the video output level of the picture is 70 to 80 IRE (for NTSC) or 490 to 560 mV (for PAL). You can use this zebra pattern as a reference when adjusting the iris manually. Adjust the iris so that the zebra pattern appears over the subject being shot (for example, the face of a back-lit person).

If it is not necessary to use the zebra pattern to adjust the iris, set the ZEBRA switch to OFF.



Close-Ups—Shooting Small or Nearby Objects



The close-up or macro function lets you zoom in flowers, insects and even photographs. The minimum distance from the lens to the object is 10 mm in the "8" wide-angle zoom position.

- 1** Adjust the distance between the lens and the object to get the desired image size.
- 2** Set the focus ring to the " ∞ (infinite)" setting.
- 3** Turn the MACRO ring in the direction of the "MACRO" arrow until it stops.
- 4** Focus by turning the manual zoom lever with the zoom selector set to "MANU".

When the close-ups operation is completed, return the MACRO ring to its original position.

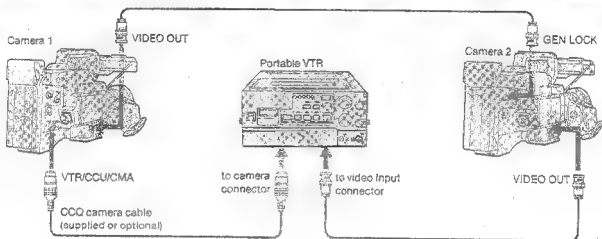
Notes

- If you wish to reduce the object's size on the screen, first adjust the focus following Steps 1 through 4 above, then turn the MACRO ring slightly toward its original position and adjust the focus with the manual zoom lever again.
- If the focus ring is set to " ∞ " while the MACRO ring is turned to "MACRO", the focus can be continually adjusted from the close-ups position to " ∞ " with the manual zoom lever.

Use of the GEN LOCK Connector

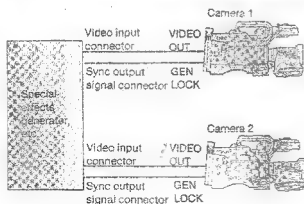
When the BS or VBS signal is connected to the GEN LOCK connector, the camera synchronizes with the connected signal. Use this connector when two or more cameras are used without a CCU.

Example 1



Camera 2 is synchronized with Camera 1.

Example 2



Camera 1 and Camera 2 are synchronized with a special-effects generator.

Adjustment of the picture tone for two or more cameras

When two or more cameras are used simultaneously in connection with a special-effects generator, etc., supply each camera with the same reference signal, and adjust each camera to obtain the same picture tone. Adjust the SC (subcarrier) phase and the H (horizontal) phase following the procedures described below.

Subcarrier phase adjustment

Adjust the subcarrier phase roughly with the SC phase selector, and make fine adjustment using the SC PHASE control. Use a vectorscope to make the adjustment easily.

Horizontal phase adjustment

Adjust the horizontal phase with the H PHASE control. Use a waveform monitor or an oscilloscope to make the adjustment easily.

Recording with a Table-Top VTR

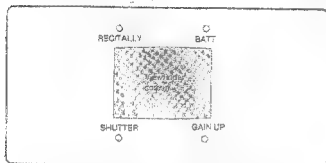
The operating procedure is almost the same as when recording with a portable VTR except for the following:

- The VTR START/RETURN VIDEO button on the camera and the VTR button on the lens do not function. Recording must be started and stopped with the function buttons on the VTR.
- The REC/TALLY indicator in the viewfinder does not function.
- The E-E mode picture (return video) and the playback picture cannot be monitored on the viewfinder screen.

Warning Indicators and Character Display

Warning Indicators on the Viewfinder

The following indications show the status of the connected camera, VTR or CCU.
(Some VTRs might have no indication function by blinking or by lighting up.)



| Indicator | When operate | Blinks | Lights up |
|-----------|--|--|--|
| REC/TALLY | While recording, using a VTR connected with a CCO cable | Until the VTR is put on the standby mode | During recording |
| | During use of a VTR (equipped with a warning system), which is connected with a CCO or a CCO/K cable | While the VTR is malfunctioning | — |
| | During use of the CCO-M3/M3P | — | When a tally signal is transmitted from a video switcher, etc. |
| BATT | • When a camera powered by a built-in NP-1A is used | — | The battery power is weak. |
| | • When a VTR is connected to the camera | The battery power is weak. | When a connected equipment is continuously operated after blinking |
| | • When a CCU is connected to the camera* | | |
| SHUTTER | Any time | — | When the SHUTTER ON/OFF switch of the camera is set to ON. |
| GAIN UP | Any time | — | When the GAIN selector is set to 9 dB or 15 dB |

*The indicator's blinking speed denotes the following:
Slow: The battery is weak.
Fast: The CCO's switcher and controls are being used.

Warning Indications on the Character Display

The following indications appear on the viewfinder screen.

LOW LIGHT

Meaning: The lighting is insufficient.

Check: The lighting. Increase it, if necessary.
The iris. Open the iris manually or activate the auto iris function.
The filter. Select an appropriate filter.
The GAIN selector. Set it to 9 dB or 15 dB.

It is possible to switch the "LOW LIGHT" indication on or off.

On: Press the UP/ON button when the character display is on the "Operational Status of the Camera" mode.

Off: Press the DOWN/OFF button when the character display is on the "Operational Status of the Camera" mode. The indication does not appear on the viewfinder screen even if the lighting is insufficient.

MEMORY NG

Meaning: The white balance and black balance adjusted values are no longer retained in the memory.

Check: The white balance and black balance values. Reset them.

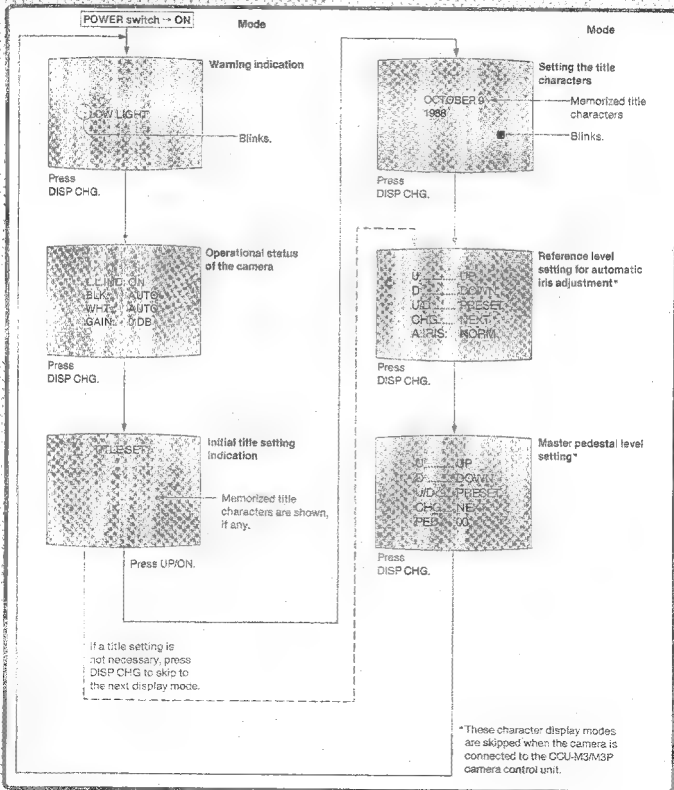
BATT :EMPTY?

Meaning: The input voltage to the camera is less than about 11.0 V.

Check: The battery. Replace it with a fully charged one.
If you continue recording with a weak battery, the quality of the recording will deteriorate.

Character Display on the Viewfinder

The following chart shows the character display mode sequence each time the DISP CHG. is pressed.



Operational status of the camera



LL IND (Setting the "LOW LIGHT" indication)

ON: "LOW LIGHT" is displayed.
OFF: "LOW LIGHT" is not displayed.

BLK (Black balance adjustment mode)

AUTO: For automatic adjustment
MANUAL: For manual adjustment using the
 CCU-M3/M3P camera control unit

WHT (White balance adjustment mode)

AUTO: For automatic adjustment
PRESET: For the factory preset value
MANUAL: For manual adjustment using the
 CCU-M3/M3P

GAIN (Setting the video output level)

0 dB, 9 dB or 18 dB.

Initial title setting indication

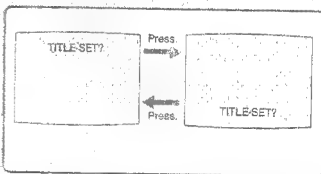


If any characters are stored in the memory,
 they are displayed here.

Perform the following procedures if necessary.

To clear all the memorized title characters:
 Press the UP/ON button and the DOWN/OFF buttons
 simultaneously.

To change the character display position:
 Press the DOWN/OFF button.



Note

When the camera is used with a VQ-6800/6800PS portable
 VTR, use only the lower character display area, because the
 VTR tape remaining time is shown in the upper character
 display area.

Warning Indicators and Character Display

Setting the title characters

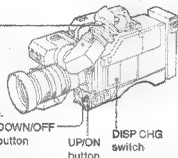
This camera has a superimposition function which allows the simultaneous showing of the picture shot by the camera and the characters by the built-in character generator on the same screen. If a recording VTR or a monitor is connected to the camera, the superimposed picture can be recorded on the VTR or monitored on the monitor screen. Use the DISP CHG switch, UP/ON button, and DOWN/OFF button to set title characters.

Preparation

- Press the DISP CHG switch until the following indication appears on the viewfinder screen.

TRICE-SET?
OCTOBER 9
1988

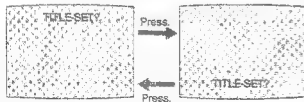
If any characters are stored in the memory, they are displayed here.



Perform the following procedures if necessary when the indications above are shown on the viewfinder screen.

To clear all the memorized title characters:
Press the UP/ON button and DOWN/OFF button simultaneously.

To change the position of the title characters:
Press the DOWN/OFF button.

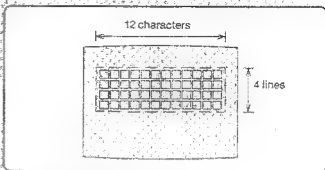


- Press the UP/ON button to set title characters.



Setting procedure

Set title characters one by one using the UP/ON button and DOWN/OFF button. Up to 12 characters can be displayed on one line, and up to 4 lines can be displayed.



Selection of letters

Repeat pressing the UP/ON button until the desired character appears inside the cursor.

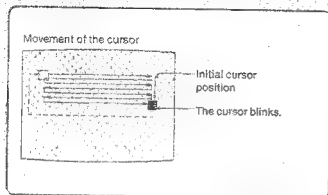
Every time the UP/ON button is pressed, the characters change in the following order.

| Order of scanning | Punctuation display |
|-------------------|---------------------|
| → ABCDEFGHIJKLM. | Point: "." |
| → NQOPRSTUVWXYZ? | Space: " " |
| → 0123456789 | Question mark: "?" |
| | Colon: ":" |
| | Period: "." |
| | Hyphen: "-" |
| | Slash: "/" |
| Goes back to "A". | |

To change the characters in reverse alphabetical order:
Press the DOWN/OFF button with the UP/ON button pressed.

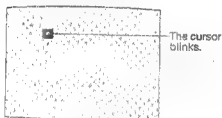
Moving the cursor

The cursor can be moved to the desired position by repeating the DOWN/OFF button. After the desired character appears, press the DOWN/OFF button, and the cursor moves one space to the right.



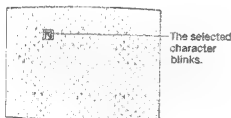
1

Move the cursor to the desired position by pressing the DOWN/OFF button.



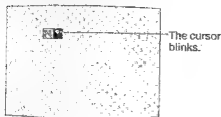
2

Select a character by pressing the UP/ON button.



3

Press the DOWN/OFF button to set the selected character, and the cursor moves one space to the right.



Notes

- The AUTO W/B BAL. switch can also be used for character setting instead of the UP/ON and DOWN/OFF buttons. To set the character position, set the switch to BLK (same function as the DOWN/OFF button), and to set the character, set the switch to WHT (same function as the UP/ON button).
 - To replace a character which has been set with a new one, return the cursor to the character's position, select the desired character with the UP/ON button, and press the DOWN/OFF button.
- The characters must be changed one by one as it is described in this section.

Memory of the title characters

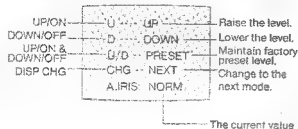
The characters and their displayed positions are stored in the memory (about 12 hours) after the character display mode is cancelled or after the power is turned off.

Set the title characters by repeating Step 1 through 3 shown above.

Setting the reference level for automatic iris adjustment

Buttons

Settings

**Purpose**

To adjust the video level of a back-lit subject so that it is not too dark.

Adjustable range

From about -1.0 to +1.0 step in about 0.5 increments.

Operation

To raise the level: Press the UP/ON button.

To lower the level: Press the DOWN/OFF button.

To reset to the normal level: Press the UP/ON and DOWN/OFF buttons simultaneously.

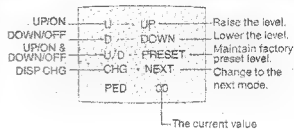
Maintenance of the adjusted value

The adjusted iris value will be retained in the memory until the power is turned off. The next time the camera power is turned on, the iris value will return to the factory preset level.

Setting the master pedestal level

Buttons

Settings

**Purpose**

Adjust to obtain a well contrasted picture while shooting outdoors.

Adjustable range

From about -30% to +31% of the reference level (0.7 V as 100%) in about 1% increments.

Operation

To raise the level: Press the UP/ON button. (If this button is pressed when the master pedestal level is +31%, "MAX" is displayed.)

To lower the level: Press the DOWN/OFF button. (If this button is pressed when the level is -30%, "MIN" is displayed.)

To reset to "00" (factory preset value): Press the UP/ON and the DOWN/OFF buttons simultaneously.

Maintenance of the adjusted value

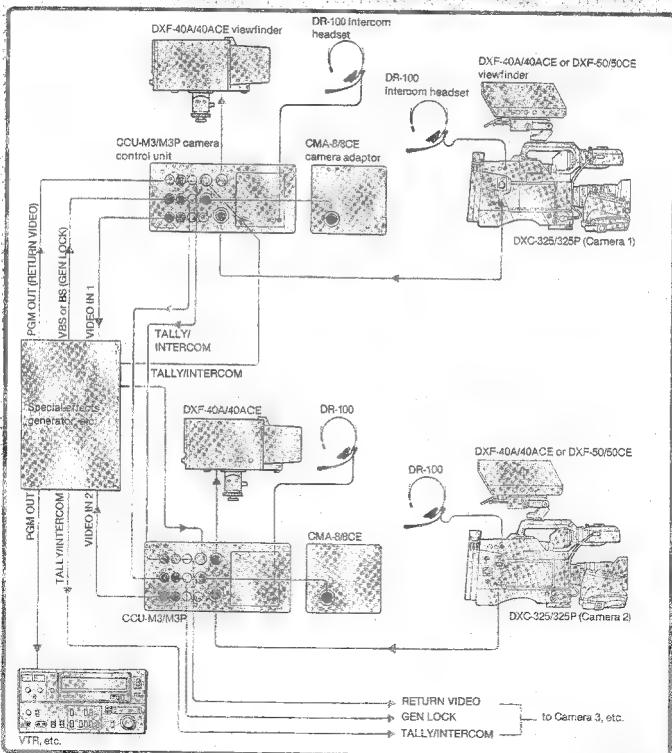
The master pedestal level is retained in the memory for about 12 hours after the power is turned off.

- If the pedestal level set by the UP/ON and DOWN/OFF buttons is to be monitored on a waveform monitor, set the ABL switch to OFF. If the ABL switch is set to ON, the correct waveform cannot be monitored.
- When a CCU-M3M3P camera control unit is connected to the camera, the auto iris reference level setting mode and the master pedestal level setting mode cannot be controlled by the camera because the CCU iris and the master pedestal values take priority over the camera settings.
- The CCU master pedestal level setting is stored in the camera's memory for about 12 hours after the CCU is disconnected from the camera.

Studio Use

When using more than two cameras simultaneously in a video studio, a special-effects generator, such as the Sony SEG-2000A/2000AP, is necessary for wiping and switching, and a CCU-M3/M3P camera control unit for matching all the camera's picture quality and color.

System Example



Hints for Better Shooting

Understanding Light and Color

Brightness levels

The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

When to use an ND filter





Exceptionally bright scenes such as sunny days at the beach in summer or on snow fields in winter will look "washed out" when recorded. To make these scenes recorded naturally, an ND filter (set the FILTER selector to the 2 position) is required.

| | |
|-----------|---|
| Unit: lux | Snow-covered mountains Snow fields Sandy beach, clear day in summer |
| 100,000 | Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000) |
| 10,000 | Overcast day, one hour after sunrise (2,000) |
| 1,000 | Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) |
| 500 | Department store counter (500 ~ 700) Station wicket (850) Office lit by fluorescent lamps (400 ~ 500) Room lit by two 30 W fluorescent lamps (300) |
| 300 | Subway station platform (300) |
| 100 | Arcade at night (150 ~ 200) Theater lobby (15 ~ 35) Candle light (10 ~ 15) |
| 10 | |

Color temperature — how to effect white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light color." The temperature of the object radiating the light is expressed in absolute temperature (K).

This is also known as the color temperature, which in turn stands for "light color." As color temperature increases, the light color changes from red to yellow to white to blue.

| Natural light color temperature (K) | Color change | Artificial light color temperature (K) |
|---|--------------|--|
| Clear sky  | 10,000 | 10,000K |
| Slightly overcast  | 8,000 | 8,000K |
| Cloudy, rainy  | 7,000 | 7,000K |
| Direct sunlight  | 5,000 | 5,000K |
| 2hr. | 4,000 | 4,000K |
| 1hr. | 3,500 | 3,500K |
| 40min. | 3,000 | 3,000K |
| Time after sunrise before sunset | 2,500 | 2,500K |
| 30 min. | 2,000 | 2,000K |
| 20 min. | 1,500 | 1,500K |
| Sunrise/sunset | 1,000 | 1,000K |
| | | Fluorescent lamp (clear) Fluorescent lamp (white) Fluorescent lamp (off white) Studio lamp Halogen lamp Tungsten lamp Candle light |

Basic Camerawork

Getting stable pictures—starts with a correct stance

For hand-held shots, shooting position is the key

Using three basic positions as a reference, practice shooting positions until you find the stance which provides the easiest shooting and best results.



- When kneeling, placing one knee on the ground provides the best stability.
- Place the eye firmly against the viewfinder eyecup.
- For hand-held shots, put the camera on your shoulder and assume a comfortable, stable position. Make sure the camera does not move.
- Relax your shoulders.

Use a tripod or monopod if possible

Use a sturdy one.

If a tripod is not available, try placing the camera on a tabletop, wall, or any other flat surface of suitable height.



- Put your right elbow firmly against your side to help stabilize the camera.
- If you are going to move the unit while recording, keep both eyes open as much as possible.
- Stand firmly with your feet comfortably apart. Leaning against something firm such as a wall or tree will also provide extra stability.

Keeping the horizontal plane level

Even if camera work is smooth and stable, shots can be tilted or off axis horizontally.



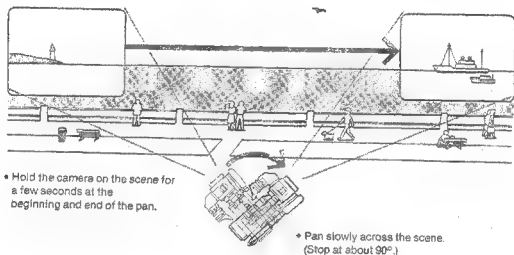
The horizontal plane can be easily determined by using the viewfinder frame as a reference.

Three frequently used shots

These three types of shots will bring additional action and movement to your scenes when properly used. For greatest effect, it is advisable that they not be overused.

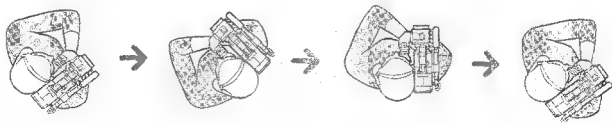
Panning—Moving the camera horizontally

For emphasizing the grandeur of a scene, and for including all of the scenery in a single continuous shot.



For professional-looking pans

- 1 First, stand so that you face in the direction where the pan will end.
- 2 Without moving your feet, rotate your upper body so that your camera faces the direction where the scene will begin.
- 3 Start shooting. Rotate your body slowly to the point where the pan will stop.



The best panning speed is one that will allow you to explain the scene during playback.

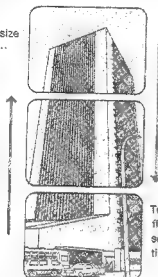
Repeated pans of the same scene should be avoided.

If you can hold your breath during panning and zooming, camera shake can be minimized, and you can concentrate more easily on the scene.

Tilting—moving the camera vertically

Tilting shots with the camera should be slightly faster than pans.

To emphasize height... tilt up.



To emphasize the final part of the scene... tilt down.

Zooming—changing the size of the subject

Because telephoto shots make camera shake more noticeable, the camera should be as stable as possible.

To draw attention to something specific... zoom in.



To end the shot by making the circumstances surrounding the scene understood... zoom out.



Sizing the scene—mixing long, medium and close-up shots

Continuous use of long shots or close-ups will give your productions a monotonous "flat" impression. To avoid this, it is important to consider exactly what it is that you wish to "say" with every shot. Indeed, it is possible to change the impression that any subject makes merely by changing the way it's shot.



You don't have to change the subject to alter the scene—you can achieve a different effect by changing the size of the subject itself within the scene.

Framing people

Basic shots for properly framing people are shown below.

Experience has shown that shots that frame people differently than this do not have as pleasant an effect.

Face shot

Even if you cut off the hairline, don't cut off the chin.



When shooting a profile, leave the space in front of the face to create a "sight line."

Bust shot—Chest and above



Waist shot—Upper hips and above



Knee shot—Knees and above



Full shot—Entire body



Cutting

Scene length

—not too long, not too short

While there's no hard-and-fast rule, it is generally advisable to make each scene 6—7 seconds in length for easier viewing.

A succession of short scenes can tire the viewer, while long, single scenes can become boring.

Cutting according to the narration

Cut the scene when the narration is finished.

Cutting according to the subject

Close-ups shorter.



Make long shots longer.

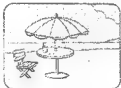


Because long shots have more to see in them than close-ups, show them longer so the viewer may understand what's there.

Make interesting shots and shots in which the subject is constantly moving longer.



Make static shots shorter.



Shoot as if you were watching the playback. That is, it's helpful to occasionally imagine your commentary of the scene even as you're shooting it!

For more effective production

In video, organization is the key

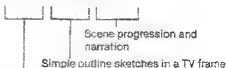
To make a first-class production, it is important to decide the contents and shooting sequence in advance. The first step is to sketch out a simple outline of the actual production based on the time-tested "five W's of journalism" (who, what, where, when, why, how). This will allow you to efficiently and effectively record the many exciting events.

Write a script of what you want to record

After the theme has been decided, think about the progression of the scenes and write down the major points of the "story flow" on paper. This is called a scenario. When writing the script, it is helpful to scout the location where shooting will take place, and, in the event of school activities or weddings, to obtain a copy of the program in advance, if possible. This will allow you to complete actual recording with a minimum of bother.

Typical scenario

| Football Tournament page 1 | | |
|-------------------------------|---------------------------------|---|
| 5 sec Tape | 5 sec FOOTBALL Tournament | Narration Match 1 Goal 1 at 2:00 |
| 10 sec Zebra out | 10 sec Zebra out | 10 sec Zebra out |
| 6 sec Cut in | 6 sec Cut in | 6 sec Cut in |
| 10 sec Cut out Planning | 10 sec Cut out Planning | 10 sec Cut out Planning |
| 2 min 10 sec | 2 min 10 sec | 2 min 10 sec |
| 2 min 10 sec Zebra in | 2 min 10 sec Zebra in | 2 min 10 sec Zebra in |



- Recording time
- Camerawork
- SE (Sound Effect)—Background music and sound effects

Lighting

For the sharpest pictures, you need the best light

For the most brilliant color in your scenes, a sufficient light level must be maintained. If shooting is done indoors or under other circumstances where light is insufficient, lights must be used for best results.

Choosing the right lights

Photography lamps or halogen lamps are recommended.

For lighting of a wide area for easy use—
reflector flood light

To emphasize the subject—use a reflector
spotlight.

Lighting the subject

The number of lights and their angle to the subject can make a significant difference in lighting effectiveness.

With a single light:

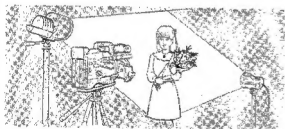
Locate it above and to one side of the subject. With just one light, contrast is unavoidably enhanced.

To eliminate shadows, another light should be added.

With two lights:

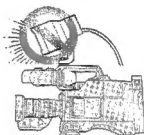
Locate one light above and to one side of the subject, and the second to the side of the subject in such a position that the shadows are eliminated.

If contrast is too strong when lights are used, point a light at the ceiling or reflect it off a sheet of white paper to add soft fill-in light.



Precautions for using lights

- Do not point the light at the camera body. Instead, make sure that it is pointed parallel to the camera or away from it. Be especially careful with lights attached to the accessory shoe.



- Floodlights (lights with wide dispersion) must not be attached to the accessory shoe. Use of a special light stand is recommended.
- Lights become extremely hot during use—do not touch them!
- Do not mix different types of light, as light color temperatures vary and can cause the subject's color to be recorded incorrectly.

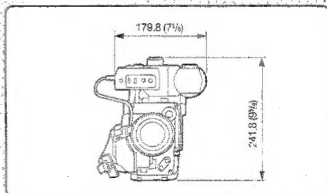
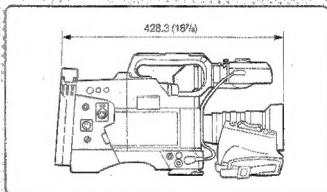
For detailed instructions on proper use of lights, carefully read the instruction manuals that accompany them.

Specifications

Camera head (DXC-325/325P) and camera adaptor (CA-325/325P)

| | |
|-----------------------|---|
| Image device | Interline-transfer CCD, 3-chip |
| Picture elements | 510 × 492 (H/V) (NTSC) 500 × 500 (H/V) (PAL) |
| Sensing area | 6.4 mm × 4.8 mm (equivalent to a 1/2-inch pickup tube) |
| Built-in filters | 1: 3200 K 2: 5600 K + 1/8 ND 3: 5600 K |
| Lens mount | Bayonet mount |
| Signal system | EIA standards, NTSC color system (for DXC-325) CCIR standards, PAL color system (for DXC-325P) |
| Scanning system | 525 lines, 2:1 interlace, 30 frames/sec. (NTSC) 625 lines, 2:1 interlace, 25 frames/sec. (PAL) |
| Scanning frequency | Horizontal: 15.734 kHz (NTSC) 15.625 kHz (PAL) Vertical: 59.94 Hz (NTSC) 50.00 Hz (PAL) |
| Sync system | Internal External with the BS or VBS signal supplied to the GEN LOCK input connector or the reference signal input to the VTR/CCU/CMA connector from the GEN LOCK connector of the CCU-M3/M3P |
| Horizontal resolution | 530 lines (center) |
| Minimum illumination | 20 lux with F1.4, +18 dB (NTSC) 20 lux with F1.4, +18 dB (PAL) |
| Sensitivity | 2000 lux with F5.0, at 3200 K (NTSC) 2000 lux with F5.0, at 3200 K (PAL) |
| Gain selection | 0 dB, 9 dB or 18 dB, selectable |
| Video output | Composite signal: 1.0 V(p-p), sync negative, 75Ω unbalanced Y/C separate signal: Y: 1.0 V(p-p), sync negative, 75Ω unbalanced C: burst level 0.288 V (NTSC) 0.3 V (PAL) *75Ω without sync |
| Signal-to-noise ratio | 58 dB (NTSC) 56 dB (PAL) |
| Registration | 0.05 % for Zone I 0.05 % for Zone II 0.05 % for Zone III |

| | |
|-----------------------|--|
| Inputs/Outputs | VTR/CCU/CMA connector: Sony Remote, 14-pin DC IN: XLR-type, 4-pin MIC IN: XLR-type, 3-pin GEN LOCK: BNC-type VIDEO OUT: BNC-type LENS: 1/2-inch lens connector (7-pin) 2/3-inch lens connector (6-pin) VF: 8-pin EAR: mini jack INTERCOM: mini intercom TITLE: 8-pin |
| Power requirements | 12 V DC |
| Power consumption | 3 W (without viewfinder) |
| Operating temperature | -5°C to +45°C (23°F to 113°F) |
| Storage temperature | -20°C to +60°C (-4°F to 140°F) |
| Weight | 3 kg (6 lb 10 oz) |
| Dimensions | See the illustrations below. Unit: mm (inches) |



Zoom lens (VCL-810BX)

| | |
|--|---|
| Focal length | 8 mm to 80 mm |
| Zoom | Manual and motorized, selectable Zooming ratio: 10× |
| Maximum aperture ratio | 1:1.4 |
| Iris control | Manual and auto, selectable 1.4 to 16 and C (closed) |
| Range of object field (at the distance of 1.1 meter) | W (wide angle): 822 × 829 mm (24½ × 32¼ inches) T (telephoto): 65 × 87 mm (2½ × 3½ inches) |
| Minimum object distance | 1.1 m |
| Filter thread | 62 mm dia., 0.75 mm-pitch |
| Mount | Bayonet mount, 1/2 inch |
| Weight | Approx. 920 g (2 lb) with hood |
| Dimensions | Approx. 90 mm dia. × 163 mm (3½ × 6½ inches) |

Viewfinder (DXF-325/325CE)

| | |
|--------------------|---|
| Picture tube | 1.5 inch monochrome |
| Indicators | REC/TALLY indicator BATT indicator SHUTTER indicator GAIN UP indicator |
| Resolution | 400 lines |
| Power requirements | 12V DC |
| Power consumption | 2.3 W |
| Weight | Approx. 500 g (1 lb 2 oz) |
| Dimensions | Approx. 182 × 64 × 389 mm (w/h/d) (7¼ × 2½ × 15½ inches) |

Carrying case (LC-325)

| | |
|------------|---|
| Weight | Approx. 4.3 kg (9 lb 8 oz) |
| Dimensions | Approx. 608 × 260 × 386 mm (w/h/d) (24 × 10¼ × 15¼ inches) |

Accessories supplied

CCQ-2BRS camera cable (with Q-type 14-pin connectors) (supplied with the DXC-325K/325PK/325L/325PL only) (1)
CA-325/325P camera adaptor (supplied with the DXC-325K/325PK/325L/325PL only) (1)
VCL-810BX zoom lens (supplied with the DXC-325K/325PK only) (1)
DXF-325/325CE electronic viewfinder (supplied with the DXC-325K/325PK/325L/325PL only) (1)
LC-325 carrying case (supplied with the DXC-325K/325PK/325L/325PL only) (1)
VCT-12 tripod attachment (supplied with the DXC-325K/325L only) (1)
Lens cap (1)
Chart for flange focal length adjustment (1)

Design and specifications are subject to change without notice.

Optional Accessories and Recommended Equipment

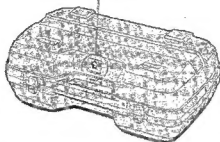
Camera control unit: CCU-M31H3P
Special-effects generator: SEG-2000A/2000AP, SEG-2550/2550P
Universal chroma keyer: CRK-2000/2000P
Wide pattern extender: WEX-200B, WEX-2000P/PK
Portable videocassette recorder: VO-6800/6800PS
Videocassette recorder: EW-9000
Electronic viewfinder (5-inch, B/W): DXF-5050CE
Electronic viewfinder (4-inch, B/W): DXF-40A/40ACE
Electronic viewfinder (1.5-inch, B/W): DXF-325/325CE
Carrier adaptor: CMA-88CE
Battery pack: NP-1A
Battery charger: BC-1WA
Zoom lens: VCL-810BX
Lens remote control unit: LR-27
Condenser microphone: ECM-672, C-74
Microphone holder: GAC-1, CAC-11A

Microphone cable: EC-05C2
Intercom headset: DB-100
Camera cable with Q-type 14-pin and K-type 14-pin connectors: CCQ-K-2
Camera cable with Q-type 14-pin and J-type 10-pin connectors: CCQ-J-2
Camera cable with Q-type 14-pin connector: CCQ-2BRS, CCQ-5BRS, CCQ-10BRS
Camera cable with Q-type 14-pin connector: CCQ-10AM, CCQ-25AM, CCQ-50AM, CCQ-100AM
Tripod attachment: VCT-12
Rack-mounting metal: RMM-1800
Carrying case: LC-325, LC-420
Title generator: TGB-325
23-inch lens adaptor: LC-32BMT

Packing (Carrying Case LC-325)

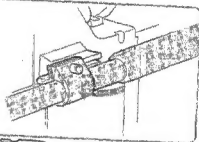
Opening carrying case LC-325

Open the case with this side on top.

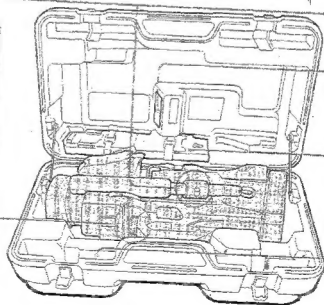
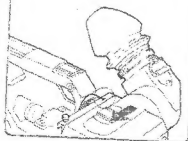


Packing

To store the camera with the microphone mounted
(When CAC-11A is used.)



Slide the viewfinder to the "►" mark, and tighten the lock ring.



CCO-28RS
camera cable

VCT-12
tripod adaptor

NP-1A
battery pack